PATENT SPECIFICATION 708,461

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COMPLETE SPECIFICATION.

Improvements in or relating to Conveyor Belts.

We, CABLE BELT LIMITED, a British Company, of 2 Rose Street, Inverness, Scotland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to conveyor belts, particularly for conveyors of the kind in which the driving load is taken by cables running over pulleys, and the belt, which is carried by the cables, serves merely to support the weight of the material being conveyed.

Belts for conveyors of this and other kinds are usually made up of a number of lengths which are connected one to another by transverse joint pins passing through alternate loops on the two connected ends, each loop being secured to one of the belt lengths by hooks pressed into the belt from opposite sides. The belt is made in long lengths, and cut off for use as required, the loops being fixed after the belt is cut.

One object of the present invention is to provide a belt in which the connection or disconnection of sections is simplified, and a dependable and lasting connection between the sections is provided.

Another object is to provide a belt in which there are no openings in the belt at the joints, so that small material cannot fall through the belt at the joints.

According to the invention, in a conveyor belt comprising a plurality of belt sections each comprising rubber or other like flexible material in which is embedded a layer of reinforcing material and each formed at each end with spaced longitudinal projections of the rubber or like material, the projections on one belt section end being adapted to fit between the projections on another belt section mating therewith, and transverse apertures being formed in all of the projections so as to form, when the said projections are interfitted, a continuous transverse slot extending from side to side of the belt to receive a transverse member passing through the apertures to connect the sections together, the ends of the reinforcing material are cut longitudinally to form projecting fingers which are folded back upon themselves to form loops embedded in the rubber or like flexible material of the longitudinal projections and surrounding the transverse apertures therein.

The drawings, which are given by way of example show one form of conveyor belt according to the invention.

In the drawings :—

Figure 1 is an underneath plan view showing the connected ends of two belt sections ;

Figure 2 is a side view of the parts shown in Figure 1 ;

Figures 3 and 4 are sections taken respectively on the lines 3—3 and 4—4 of Figure 1, showing only the belt section on the right-hand side of that Figure ; and

Figure 5 is a perspective view of one belt section end, viewed from the underside.

Referring to the drawings, two belt sections are shown at 10 and 11 respectively, each belt section being formed by moulding india rubber on a layer of reinforcing material 12, which reinforcing material may be duck. The rubber forms a layer 13 on the load supporting side of the belt which is thicker than the layer 14 on the underside. The belt is made in lengths each having at its ends a plurality of longitudinally projecting parallel-sided projections 15 all of the same width and separated by spaces 16 of the same width as the projections, there being the same number of projections 15 as there are spaces 16, so that there is a projection at one side edge of the belt section and a space at the other.

[*Pr*

Each belt section is made with the projections at one end in alignment with the spaces at the other end, and the projections are similarly disposed on all the belt sections, so that when the projections on either end of any belt section are interfitted with the projections on either end of any other belt section, the two sections are in alignment.

Before the belt is moulded, the ends of the reinforcing material are cut longitudinally to form fingers of equal width, the fingers being alternately longer and shorter. The longer fingers, as shown at 17 in Figure 4 are folded back to form loops 18 which lie beyond the undivided part of the reinforcement 12, whilst the shorter fingers, as shown at 19 in Figure 3, are folded back upon themselves to form loops 20 which lie against the underside of the undivided part of the reinforcement. The roots of the fingers 17 and 19 are at the point 21. At equal intervals along the belt additional pieces of reinforcing material 22 are attached to the main reinforcing material 12 to provide transverse loops.

The rubber is then moulded over the reinforcing material 12, the covering being formed of greater thickness on the underside of the belt at each point where a piece of reinforcing material 22 is located, and at each end, as shown at 23 and 24 respectively, each thickened portion 23 having a central part of uniform thickness, and tapering down to the normal thickness of the belt as shown in Figure 2. The thickened portions 24 also taper down to the normal thickness of the belt as shown in Figures 2, 3 and 4. Transverse openings 25, surrounded by the loops formed by the reinforcing material 22 extend through the thickened portions 23. The thickened portions 24 are divided to form the projections 15, each such projection having a transverse aperture 26 surrounded by the loop 18 in one of the longer fingers 17 of the reinforcing material. The apertures 26 in the group of projections 15 at each end of a section of belt are in alignment.

Webs 27 are formed between the roots of the projections 15 on the upper side of the belt, and the ends of the projections 15 are recessed, or reduced in thickness, as shown at 28.

When the ends of two belts sections are brought together, as shown in Figures 1 and 2, the projections 15 on one section 10 fit closely between the projections 15 on the other section 11, and the webs 27 fit into the recesses 28 in the projections of the other belt section, the apertures 26 in both groups of projections then being in alignment. A spring steel bar 29 is passed through the apertures to hold the two sections together. As all the projections 15 are of equal width and length, there are no gaps in the joint, and even if stretching of the belt tends to open up gaps between the ends of the projections and the ends of the mating recesses, the overlap of the webs 27 with the recesses 28 is sufficient to prevent any actual gap from being produced.

Spring steel bars 30 similar to the bar 29 are passed through the openings 25, and the bars 29 and 30 have mounted on their ends heads (not shown) for engagement with cables on which the belt is supported, and by which the drive is transmitted thereto. The resilience of the bars 29 and 30 enables the belt to assume a troughed formation under the weight of material carried by it, but to reassume a flat formation when the load is removed.

The reinforcing material can be cut without waste from long lengths of such material, since the long fingers of two sections are staggered laterally and the long fingers of one section can be formed by material lying between the long fingers of another.

It has previously been proposed to build a conveyor belt from a plurality of belt sections each formed at each end with spaced longitudinal projections, the projections on one belt section end being adapted to fit between the projections on another belt section mating therewith, transverse apertures being formed in all of the projections so as to provide, when the projections are interfitted, a continuous transverse slot extending from side to side of the belt to receive a transverse member passing through the said apertures to connect the sections together, the belt section comprising rubber moulded on a woven reinforcement the warp members of which are looped at the ends of the section to form bights surrounding the transverse apertures in the projections.

In the arrangement according to the present invention, the reinforcement of the projections is not formed by bights in the warp threads of the reinforcement, but by fingers cut in the ends of the said reinforcement and having their free ends folded back to form the loops surrounding the transverse apertures.

What we claim is :—

1. A conveyor belt comprising a plurality of belt sections each comprising rubber or other like flexible material in which is embedded a layer of reinforcing material and each formed at each end with spaced longitudinal projections of the rubber or like material, the projections on one belt section end being adapted to fit between the projections on another belt section mating therewith, and transverse apertures being formed in all of the projections so as to form, when the said projections are interfitted, a continuous transverse slot extending from side to side of the belt to receive a transverse member passing through the apertures to connect the sections together, wherein the

ends of the reinforcing material are cut longitudinally to form projecting fingers which are folded back upon themselves to form loops embedded in the rubber or like flexible material of the longitudinal projections and surrounding the transverse apertures therein.

2. A conveyor belt according to Claim 1, wherein webs are provided which extend between the inner ends of the projections of each set, the projections being reduced in thickness at their outer ends so that the webs between the projections of one set overlie the portions of reduced thickness of the other projections.

3. A conveyor belt according to any preceding claim, wherein the end portions of the belt in which the longitudinal projections are formed have a greater thickness than the belt itself.

4. A conveyor belt comprising a plurality of belt sections, having connecting means between the sections substantially as described with reference to, and as shown, in the accompanying drawings.

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PROVISIONAL SPECIFICATION.

Improvements in or relating to Conveyor Belts.

We, CABLE BELT LIMITED, a British Company, of 2 Rose Street, Inverness, Scotland, do hereby declare this invention to be described in the following statement :—

This invention relates to conveyor belts, and more particularly to belts for conveyors of the kind in which the driving load is taken by cables running over pulleys, and the belt, which is carried by the cables, serves merely to support the weight of the material being conveyed.

Belts for conveyors of this and other kinds are usually made up of a number of lengths which are connected one to another by transverse joint pins passing through alternate loops on the two connected ends, each loop being secured to one of the belt lengths by hooks pressed into the belt from opposite sides. The belt is made in long lengths, and cut off for use as required, the loops being fixed after the belt is cut.

The object of the present invention is to provide a belt in which the connection or disconnection of sections is simplified, and a dependable and lasting connection between the sections is provided.

In a conveyor belt according to the invention, each belt section is formed at its ends with a plurality of spaced projections having transverse apertures therein, a joint between adjacent ends of belt sections being made by interfitting the projections on the said ends with each other, and passing a bar or pin through the apertures in the interfitted projections, and webs provided between the projections overlap the projections interfitted therewith to eliminate openings in the belt surface at the joints.

The projections are preferably moulded integrally with the belt, the reinforcing fabric of which extends into the said projections and forms a loop around the aperture in each such projection.

The projections on the end of a belt section are staggered transversely with respect to the projections on the other end, so that by selecting the appropriate ends adjacent sections can be assembled in accurate alignment.

In one form of belt according to the invention, which will now be described by way of example, the belt includes a layer of textile reinforcing material, such as duck, covered on both sides with rubber, the rubber being thicker on the load-supporting side of the belt. The belt is made in lengths intended to be used without cutting, and provision is made at the end of each length for receiving joint pins by which the lengths are connected together.

The ends of the reinforcing material are cut longitudinally to form a plurality of fingers of equal width which are alternately shorter and longer, there being equal numbers of short and long fingers so that there is a long finger at one side of the belt and a shorter finger at the other. The short fingers are folded back to form loops lying against the undivided lower surface of the reinforcement, and the longer fingers are folded back to provide loops projecting from the end of the undivided part of the reinforcement.

The belt is then moulded, its ends being formed with longitudinal projections in which the projecting loops of the reinforcement are embedded, each projection having a transverse aperture which is surrounded by the loop of the reinforcement, and being of the same width as the space between adjacent projections. The end portion of the belt including the projections is thicker than the main body of the belt, the thickening being provided on the lower side of the belt. The thickness starts to increase at some distance

from the end, and increases progressively towards the end, until, at a point just short of the roots of the projections, the upper and lower surfaces again become parallel. The projections on the two ends of a belt section are staggered transversely, so that any two or more belt sections, when joined end to end, can be arranged in true alignment.

The free extremity of each projection is reduced in thickness on its upper face for a short distance, and a web is provided between the roots of each pair of projections at the upper surface of the belt, so that, when two belt section ends are joined, the reduced ends of the projections pass underneath the webs. Thus stretching of the belt will not open up gaps between the ends of the projections on one section ends and the ends of the spaces on the other, and the passage of dust or small fragments of material through the belt is prevented.

It will be seen that as the projections on the belt ends are staggered, the reinforcing material can be cut without waste, the material cut from the shorter fingers of one section forming the longer fingers of the next.

The belt sections are secured together by passing a metal bar or strap through the apertures in the interfitted projections. The bar or strap is preferably resilient, and, with other similar straps passed through openings in longitudinally spaced bulges in the underside of the belt, it may carry at its ends heads for engaging the cables on which the belt is supported, the straps thus forming the connecting means between the belt and the cables.

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708,461 COMPLETE SPECIFICATION
1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

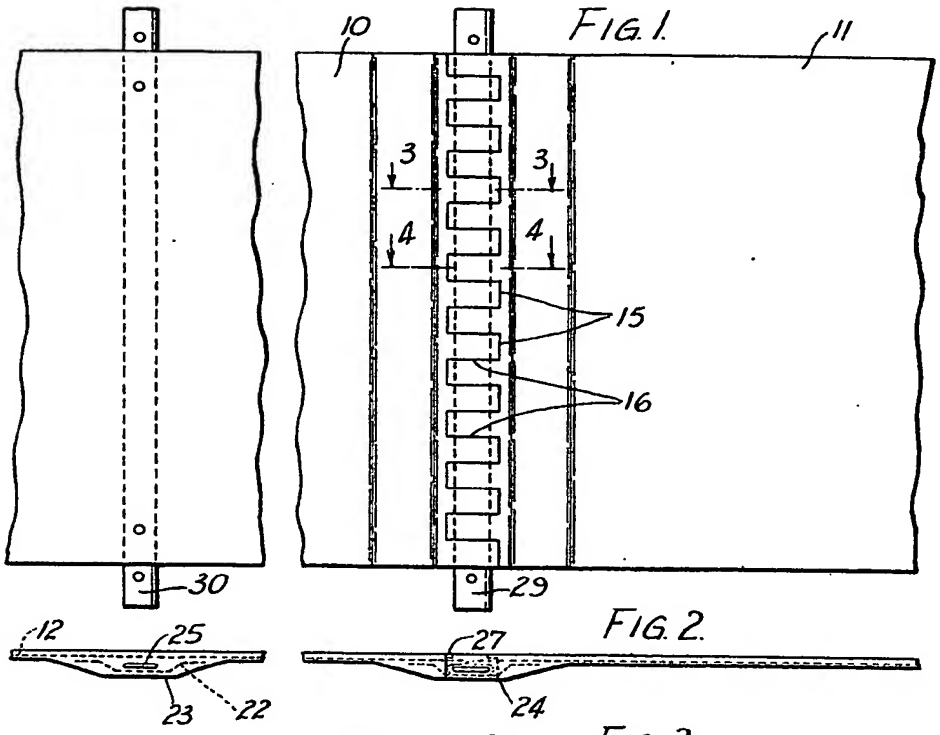

FIG. 1.

FIG. 2.

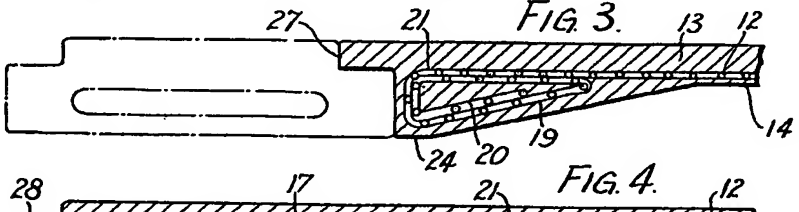

FIG. 3.

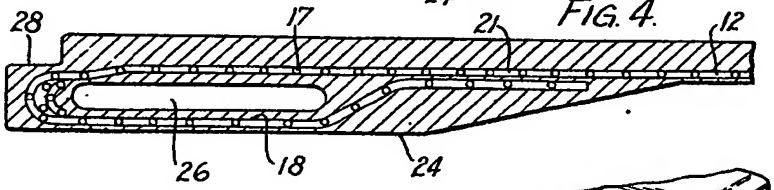

FIG. 4.

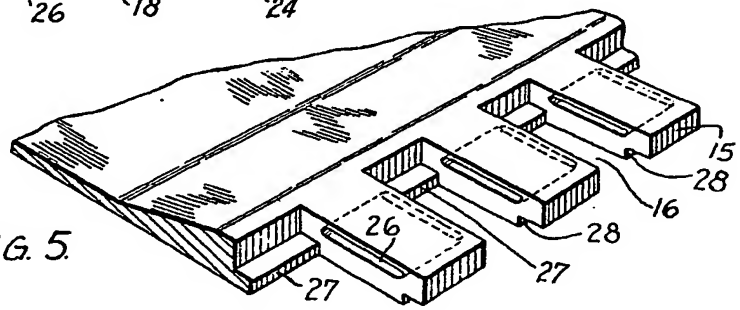

FIG. 5.

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